Power Electronics and Drives

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Power Semiconductor Devices: Diode, BJT, MOSFET, SCR, Triac, GTO, IGBT, MCT and their V-I characteristics, ratings, driver circuits, protection and cooling; AC-DC Converters (Rectifiers): Diode rectifier, thyristor based rectifier, effect of source inductance, single/three phase rectifiers, semi/full rectifiers, power factor, harmonics; DC-AC Converters (Inverters): Concept of switched mode inverters, PWM switching, voltage and frequency control of single/three phase inverters, harmonics reduction, other switching schemes - square wave pulse switching, programmed harmonic elimination switching, current regulated modulation switching - tolerance band control, fixed frequency control; voltage source inverter (VSI), current source inverter (CSI); DC-DC Converters (Chopper): Principle; buck, boost and buck-boost converters; AC Voltage Controllers: Principle of ON-OFF control and phase control, single/three phase controllers, PWM AC voltage controller, cycloconverters; Electric drives: introduction and classification. DC motor drives: speed-torque characteristics of shunt, series, PMDC motors; dynamic models; speed and position control methods; AC motor drives: d-q model of induction motor; constant flux speed control structure; vector control model; vector control structure.

Texts:


References:


